tive or quantitative changes in the secretion of this gland which would modify the course of the disease, and many favorable reports have been published advocating its use. One of the most recent reports on this form of treatment which we have seen is that of Pfeifer, based upon a study of fifty-one cases, together with the histological findings and the results of experimental research. His conclusions were that the Roentgen treatment of exophthalmic goitre is ineffectual, as a rule, and should not supplant better tried methods.

Serum treatment.—Some eight or ten forms of sera and preparations from the thyroid have been used with greater or lesser success, but so far as we are aware, the end-results of such therapy have not done more than to suggest that these too must be relegated to the large class of therapeutic measures which, at the time of their introductions, were hailed as specific.

The last preparation of this category—the serum prepared by Rogers and Beebe—will, it is hoped, live up to the promises which its use thus far has given.

The method of its preparation is very briefly as follows: Two large goitres recently obtained from patients suffering from Graves' disease furnished the necessary material. These were ground to a pulp, and the nucleo proteids and globulins—including the thyroid globulin, which is supposed to be the active secretion of the thyroid gland—were precipitated. At different times the precipitate was injected into rabbits, and after five or six weeks the animals were bled to death from the carotid artery. Rogers treated ten cases with the serum thus obtained with extremely satisfactory results. Typical cases were cured. In a later paper he reports the results obtained in ninety cases. Twenty-five per cent were cured of all symptoms; 59 per cent were more or less improved; 12 per cent at that time were unimproved, and 4 per cent died.

Barker, in a symposium on Graves' disease held at the last meeting of the American Medical Association, closed his paper with these words:

"At the present time, there is fair prospect that the treatment of the disease may again be transferred from the surgeon to the physician. The remarkable results obtained in a number of cases by Rogers and Beebe through the use of their curative serum gives us good reason to hope that a method will ultimately be perfected which will permit the internist to accomplish with his needle that which he now asks the surgeon to do with a knife."

Until sufficient clinical proof of the value of this treatment is submitted, it would appear that it is the duty of the internist to give his patients who are not improving under medical treatment the advantage of the truly brilliant curative results obtained by surgery. Both surgeon and internist advise medicinal treatment; this failing, surgery is indicated. It is unfortunate that the majority of these cases have not reached the surgeons at a time when operation is attended with low mortality. Too often the fault lies with the internist that only the hopeless cases, and those that have grown steadily worse under prolonged medical treatment, are operated on at a time when the attending mortality must necessarily be high. The dictum to try medical treatment first, and if this fails turn the patient over to the surgeon, is too frequently productive of danger to the patient, for too great a delay subjects the patient to the same dangers of life-destroying sequalæ and complications in exophthalmic goitre as in diseases of the gall-bladder, peptic ulcer, and other conditions, the treatment of which is partly medical and partly surgical.

THE SURGICAL TREATMENT OF GOITRE.*

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The surgical treatment of goitre did not assume any degree of importance in the United States until five years ago, when, owing largely to the communications of Theodor Kocher and his son, Albert, as to their results in the treatment of over two thousand cases, the medical profession of this country began to realize how much could be done surgically for the relief of many conditions dependent upon the thyroid gland. The previous mortality attending such operations, which had deterred physicians from recommending surgical relief, was shown to be referable in large measure to technical errors, but now that the surgeons have improved their methods they are attaining results comparable with those in countries where goitre is endemic. The Pacific Coast offers a fair field in this line of work, since goitre is somewhat common in a number of localities, as shown particularly by the investigations of Moffitt. [1]

Surgical treatment of a goitre may be demanded—1st, on account of its size; 2d, because of pressure symptoms affecting the trachea, larynx, esophagus or other important structures in the neck or upper portion of the thorax; 3d, when the growth is rapid, giving rise to the suspicion of malignancy; 4th, because of infection of the goitre; 5th, when Basedow symptoms are present.

Large-sized goitres may exist without producing any symptoms, but more often either by traction or pressure on the neighboring tissues they give rise to discomfort and cosmetically they are a disfigurement. One must also consider that malignant changes may easily occur in large goitres and render operation imperative.

Pressure symptoms are often noted in comparatively small goitres, especially where the tumor is at or near the median line. In some cases the gland masses grow directly backward and inward and press on the esophagus and recurrent laryngeal nerve, producing characteristic symptoms. Often, however, the trachea is flattened in one or another direction and respiration is interfered with. Difficulty in swallowing is quite commonly associated with dyspnea, for the esophageal walls are soft and yield to pressure transmitted through the harder trachea.

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Rapid growth of a goitre may be due to a simple hyperplasia, but often it is in the first indication of a carcinomatous or sarcomatous degeneration. It is advisable in such cases to administer iodides for ten days to two weeks and if the growth be benign a rapid subsidence will be noted. It is to be remembered, however, that iodides will sometimes produce Basedow-like symptoms in the presence of goitre such as loss of weight, palpitation, tremors, sweating and other nervous manifestations, hence the iodides should be discontinued when such symptoms appear.

Infection of a goitre is more apt to occur than infection of a normal thyroid, but nevertheless, in goitrous districts, it is an uncommon incident. Kocher, for instance, had but eight cases of strumitis in his last reported one thousand operative cases of goitre.[2] It is, however, probable that infections such as influenza and tonsillitis have some casual relationship with the growth of many goitres without leading to suppuration. A history of some such general or local infection immediately preceding the development of a goitre is obtainable in many cases.

Basedow's or Graves' disease is now recognized by the great majority of observers as being dependent upon the thyroid gland. The pathological researches of McCallum[3] and others have shown a marked increase of the active epithelium lining the acini, while many clinical reports have demonstrated that removal of the thyroid is followed by a cure or marked improvement in the great majority of Basedow cases. Moreover Kocher[2] states that he has never seen a Basedow case without enlargement of the thyroid.

The distinction is made by many of primary and secondary forms of exophthalmic goitre, the primary being those in which the development of Basedow symptoms is coincident with the growth of the goitre, while in the secondary form Basedow symptoms are engrafting upon an existing goitre. Personally, I can not see much reason for this distinction, for the following reasons: 1st, while the goitres may differ pathologically in some respects, so far as areas of highly active epithelial cells are concerned they are alike; 2d, from a symptomatic and therapeutic standpoint they are alike; 3d, we are dependent for our classification of the two forms largely upon the patient's previous history, and experience has taught us that such histories can not always be relied upon, especially when it comes to the observation of deeply situated masses in the neck. Many patients with marked Basedow's disease do not know that they have any unusual neck condition until it is brought to their attention by the physician, and to designate such cases with only slight or moderate enlargement of the thyroid as primary is not, to my mind, necessarily justified by the facts.

Operative treatment of exophthalmic goitre is indicated when after rational internal medication for a period not longer than three months the patient is not materially improved or cured. The statistics of Albert Kocher[4] showing that out of 254 cases 83 per cent were cured by operation and but 2 per cent died, is good evidence of the value of such measures, especially when contrasted with the poorer results following medical treatment. Barker[5], of Johns Hopkins, goes so far as to say that "In the present state of knowledge and practice, therefore, once a positive diagnosis of exophthalmic goitre has been made, it is, in my opinion, the physician's duty and privilege to recommend operation early." There is no doubt in my mind that the percentage of cures will be measurably increased when physicians adopt Barker's suggestion and the fatalities will be reduced to a minimum.

We come to the various operative procedures which may be employed in dealing with goitres. They are excision, enucleation, resection, exenteration of goitres, ligation of the thyroid arteries, division of the isthmus, and resection of the sympathetic ganglia. By far the most important procedure is excision. It is applicable to the majority of goitres and gives better results. The technic of this operation has been elaborated and described so carefully by Kocher that it need not be given in this brief paper.

The method of enucleation as devised by Porta and Socin seems to be in vogue in France. It contemplates the removal of nodes and masses of thyroid tissue from within without disturbing the posterior portions of the capsule. In selected cases it is of considerable value, but to make it a routine practice will lead to many disasters and fail to effect a cure in many cases. I have analyzed the cases reported by Delore and Chalier.[6] They report fifty goitres treated by intraglandular enucleation. Of these, one patient died—several severe hemorrhages were met with—tampons were used rather frequently—the recurrent laryngeal nerve was caught in one case and the healing was slower as a rule than with excisions. Shepherd[7] also did a number of intraglandular enucleations but abandoned the method after having two severe post-operative hemorrhages.

Resection as proposed by Mikulicz is also of value in selected cases, especially where after the removal of one lobe it is desired to remove a portion of the oter. By crushing with suitable forceps along the proposed line of division, the gland substance can be reduced to a ribbon of tissue which is easily ligated, and the stump left will not be so apt to bleed nor exude colloid material.

Exenteration is practically a form of enucleation, and is employed in the presence of large masses of broken-down gland tissue.

Ligation of some of the thyroid arteries, as first advocated by Wolfler, is employed to-day more as a preparatory measure for a more radical procedure than for its curative value. The superior thyroids being easier of access than the inferior are usually selected. The goitre undergoes considerable atrophy and many of the toxic symptoms in Basedow's disease are abated, temporarily at least. This procedure is frequently used by Kocher in profound Basedow cases and later followed by an excision.

Division of the thyroid isthmus was first advised, I believe, by Horsley for the cure of Basedow's disease, but the results do not seem to have justified

the idea that sufficient atrophy of the lobes would ensue to effect a cure.

Excision of the cervical sympathetic ganglia for the treatment of Basedow's disease, as first proposed by Edwards and later carried out by Jaboulay and Jonnesco, has been attended by such poor results that it is, for the preesnt at least, an operation not to be considered.

There are a few dangers connected with goitre operations which should be mentioned. Excision of too much of the thyroid will lead to operative myxedema—cachexia thyreopriva. The estimation of just how much to leave is at times a difficult matter, especially when both lobes are diseased, but should too little functionating gland be left the mistake can be corrected by the administration of thyroid extract or the implantation of thyroid tissue in the spleen, as has been successfully done by Payr [8] in a case of cretinism. More often, operators are apt to remove too little of the gland in Basedow's disease and the symptoms are not entirely abated. A second operation should be done in such cases.

Another danger to which attention has recently been strongly drawn by Halsted [9] is the removal of the parathyroid glands or their destruction during operations on the thyroid. Such an accident may be followed by tetany. The proper course to pursue in such cases is to administer parathyroid glands in some form—preferably the fresh parathyroids of beeves—and later, if possible, to implant one or more glands in the spleen. The parathyroids being small and rather irregularly located behind the thyroid are not easy to detect, and the safest plan to avoid them is to ligate the thyroid vessels as close to the gland as possible or to leave a portion of the posterior capsule, as advocated by Chas. Mayo.[10]

The danger of injury to the recurrent laryngeal nerve is mentioned in almost every surgical paper on goitre, but in this case repetition will do no harm, because its division leads to paralysis of the vocal cords and frequently to inhalation pneumonia. There are a few reports of successful suture of the nerve, but as a rule the damage is irreparable.

The presence of a so-called goitre-heart is in many cases a contraindication to a strumectomy. Thus dilation of one or more of the heart chambers, muscular and valvular changes, tachycardia and irregularity may be due to goitres, either from the dyspnea or pressure on the blood vessels produced by them, or from the systematic effects—the thyreotoxic effects, as observed especially in Basedow cases. Proper medical treatment will in most instances restore these patients to a condition in which operation may be done with comparative safety, but a careful estimate of the soundness of heart and lungs should first be made by some one competent to judge.

The choice of an anesthetic is an unsettled question in America to-day. The majority of surgeons in this country are inclined to use ether, but such is not the practice of continental surgeons and especially Kocher, who, with hi sexperience in over three thousand goitre operations, is entitled to speak with the greatest authority. His preference is for local anesthesia and only occasionally does he find it necessary to employ a general anesthetic. The only real argument in favor of general anesthesia is the abolition of pain, whereas there are a number of serious objections to its use. The depressing action of an anesthetic on a weakened heart—and practically all the Basedow as well as many simple goitre cases have some heart changes; the lowering of the blood pressure; the turgescence of the blood vessels in the neck; the danger of unwittingly injuring the recurrent laryngeal nerve; and the post-operative vomiting leading to hemorrhage and soiling of the wound are sufficient, in my opinion, to rule out general anesthesia for the majority of these operations. I have found it necessary to supplement local anesthesia with ether in one case where dense adhesions were encountered, but have not used it otherwise except in malignant cases.

The mortality of operations, other than strumectomy, in cases of Basedow's disease was investigated by Hirst [11], who concluded that the existence of exophthalmic goitre added about 15 per cent to the mortality of any operation performed upon the patient. Unless some other operation is imperative, it follows that the goitre should first be looked after.

My personal experience in goitre operations embraces but eighteen cases. Of these two were malignant, secondary to cancer of the larynx; three were simple goitres; three were early Basedow cases; and in ten cases Basedow symptoms were marked. The immediate mortality was nil, and I have been able to trace sixteen out of the eighteen patients, with the following results: The two malignant cases proved fatal from recurrences after intervals of four years and five months respectively; the three patients with simple goitre are cured; two of the three beginning Basedow cases were traced and were well. The after histories of nine out of the ten marked Basedow cases were obtained and showed that six are practically well and three much improved.

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